

INSTRUCTION MANUAL

STATISTICAL ANALYSIS

CORRELATION & REGRESSION
DISTRIBUTIONS NOR,T,F,X²
MULTIPLE REGRESSION
DESCRIPTIVE ANALYSIS
ANALYSIS OF VARIANCE
CHI SQUARE ANALYSIS

CAT. NO.
26-3522



STATISTICAL ANALYSIS PROGRAM



Statistical Analysis

Radio Shack®
A DIVISION OF TANDY CORPORATION
FORT WORTH, TEXAS 76102

**Statistical Analysis Program:
©1982 Tandy Corporation
All Rights Reserved.**

**Statistical Analysis Program Manual:
©1982 Tandy Corporation
All Rights Reserved.**

Reproduction or use, without express written permission from Tandy Corporation, of any portion of this manual is prohibited. While reasonable efforts have been taken in the preparation of this manual to assure its accuracy, Tandy Corporation assumes no liability resulting from any errors or omissions in this manual, or from the use of the information contained herein.

Please refer to the Software License on the inside back cover of this manual for limitations on use and reproduction of this Software package.

Table of Contents

Introduction	1
Required Equipment	1
Loading Instructions	1
Using the TRS-80	
Pocket Computer Printer	2
Descriptive Statistics	3
Correlation and Regression	5
Analysis of Variance	7
Chi Square Analysis	10
Distributions	13
Normal Distribution	14
t Distribution	14
F Distribution	15
Chi Square Distribution	15
Multiple Regression	17
Appendices	
A—Making a Backup	20
B—Maintenance	21



Introduction

The Pocket Computer Statistical Analysis Package is a data analysis system for use on the Radio Shack Pocket Computer I. The system consists of six programs:

DS—Descriptive Statistics

CR—Correlation and Regression

AV—Analysis of Variance

CS—Chi Square Analysis

DI—Distributions (normal, t, F, X²)

MR—Multiple Regression

A keyboard template is included for each of the programs. Using the templates guides you in running the programs and reduces the need for you to refer to this manual as often.

As with any computer system, very large values (positive or negative) and values containing many decimal places are subject to rounding errors.

Additionally, some operations may magnify rounding errors. In most instances, the rounding errors should be negligible. Be careful when you enter data values, so you can avoid "bad" output.

If you are using your Pocket Computer for the first time, please refer to your owner's manual for instructions. If this is the first time you have used

the Printer/Cassette Interface, refer to your Printer/Cassette Interface instruction manual.

Required Equipment

To use the Statistical Analysis Package, you need the following equipment:

- The TRS-80 Pocket Computer I, Cat. No. 26-3501
- The TRS-80 Printer/Cassette Interface, Cat. No. 26-3505 or 26-3503
- A cassette recorder, such as the Radio Shack Minisette-9, Cat. No. 14-812

Loading Instructions

Each program is loaded from tape in a similar manner. To load any of the Statistical Analysis programs, follow these instructions:

1. Connect the Cassette Interface to the cassette recorder and install the computer in the Cassette Interface. If you are using a printer, turn on the Print and Power switches. The Remote switch should be off.
2. Place the Statistical Analysis cassette you wish to use in the recorder and rewind the tape to the

beginning, or position the tape to a point just prior to the desired program. When the tape is rewound, press the "Stop" button. If you are using a printer, turn the Remote switch on. We recommend that the volume control setting be between 8 and 10 on your recorder (or between 5 and 7 if you are using a Minisette-9). If your recorder has a tone control, set it at maximum treble. Now press the recorder's "Play" button.

3. Turn on the computer and make sure it is in DEF mode. Type: **C L O A D # name #** and press **ENTER** (name refers to the name of the program to be loaded). For example, to load the Descriptive Statistics program, type:
C L O A D # D S # and press **ENTER**. The > prompt will reappear when the loading process is complete. If you are using a printer, turn the Remote switch off.

If your work requires frequent loading of different programs in this package, you might want to save some or all of the programs on separate cassette tapes (one program on each side). By doing this, the computer will not have to search through any programs ahead of the one you want to run. Refer to Appendix A—Making a Backup, for instructions on saving copies of programs.

Using the TRS-80 Pocket Computer Printer

Each of the programs in Statistical Analysis includes a feature which lets you label printed output. Simply type in a label using seven characters or less (do not use the " character), and press **SHFT A**. The label will be printed. You can print the statistic corresponding to that label by pressing **SHFT** and the appropriate key, indicated on your template. The resulting printout will be labeled.

Descriptive Statistics

The Descriptive Statistics (D S) program provides you with an overall picture of your data set. The data set can contain up to 130 data values. Output from the Descriptive Statistics program includes sample statistics (sample size, mean, sum, sum of squares, variance, standard deviation) and unbiased estimates of population parameters (variance, standard deviation, standard error of the mean).

Descriptive Statistics contains 12 options:

SHFT SPC

Starts DS, or clears the Pocket Computer's memory so you can enter a new data set.

SHFT =

Lets the computer accept each data value entered.

SHFT A

Lets you enter a label for use with your printer.

SHFT S

Displays an unbiased standard deviation estimate.

SHFT D

Displays an unbiased variance estimate.

SHFT F

Displays standard deviation of sample statistics.

SHFT G

Displays variance of sample statistics.

SHFT H

Displays the sum of squares of sample statistics.

SHFT J

Displays the sum of sample statistics.

SHFT K

Displays the mean of sample statistics.

SHFT L

Displays the number of subjects.

SHFT Z

Displays an unbiased estimate of the standard error of the mean.

After loading DS, press **SHFT SPC** to start. The name of the program and a copyright notice will be displayed. Place the Descriptive Statistics template over your keyboard.

Begin entering data values by typing the first value on the keyboard and pressing **SHFT =**. After each data value is entered, the computer will display the number of values stored so far.

You may display the statistics for the stored data values at any time. Press **SHFT** and the appropriate key, as indicated on the template. For example, to see the standard deviation, press **SHFT F**, and the answer will be displayed.

You can enter additional data by typing in the data value and pressing **SHFT E**. To clear the memory and begin a new data set, press **SHFT SPC**.

Sample Run

The computer displays:

>
DS COPR.1982 TANDY CORP

1

2

3

4

5

34.52

6

7

34.68571429

You type:

SHFT SPC

4 5 . 6

SHFT -

2 7 . 8

SHFT -

3 3 . 2

SHFT -

4 0 . 3

SHFT -

2 5 . 7

SHFT -

SHFT K

3 1 . 9

SHFT -

3 8 . 3

SHFT -

SHFT K

Correlation and Regression

The Correlation and Regression (CR) program performs several operations on data pairs (X,Y). Up to 50 pairs of data may be entered. Output from the CR program includes the sample size, the Pearson product-moment coefficient for the correlation between X and Y, the regression coefficients (slope and Y intercept), and the standard error of prediction for Y'.

CR also performs a t test for matched pairs and displays the t value and degrees of freedom (N-1). You may also display predicted values of Y, given entered X values.

Correlation and Regression contains 11 options:

SHFT SPC Starts CR, or clears the Pocket Computer's memory so you can enter a new data set.

SHFT - Lets the computer accept each data value entered.

SHFT A Lets you enter a label for use with your printer.

SHFT S

Displays the degrees of freedom for the t test.

SHFT D

Displays the t value.

SHFT F

Displays the predicted value of Y.

SHFT G

Displays the standard error of prediction for Y'.

SHFT H

Displays the Y intercept.

SHFT J

Displays the slope.

SHFT K

Displays the product-moment coefficient for the correlation between X and Y.

SHFT L

Displays the number of data points.

After loading CR, press **SHFT SPC** to get started. The program name and a copyright notice will be displayed. Place the CR template over your keyboard.

You can start entering data pairs by typing the X value on the keyboard and pressing **SHFT -**. The computer will display an asterisk (*). Type the

matching Y value, press **SHFT** =, and the display will show the number of pairs stored so far.

You may display statistics for your stored pairs at any time, **except** when you are in the midst of entering a pair (when the computer is displaying *). To see the statistics, press **SHFT** and the appropriate key, as indicated on your template. For example, to see the Y intercept, press **SHFT** H.

To find predicted values of Y for specific X values, type the X value on the keyboard, and press **SHFT** F. The predicted Y value will appear on the display.

You may enter additional data pairs at any time by typing the X and Y values and pressing **SHFT** = after each entry. Or, you may clear the memory and begin a new data set by pressing **SHFT** SPC.

After finding the t value and degrees of freedom for a data set, you can find the chance probability level for the test by running the Distributions program (DI).

Sample Run

The computer displays:

>
CR COPR.1982 TANDY CORP
•
1
•
2
•
3
•
4
•
5
8.723247332E-01
•
6
8.146755365E-01

You type:

SHFT SPC
1 **5** **SHFT** =
1 **8** **SHFT** =
2 **0** **SHFT** =
2 **6** **SHFT** =
1 **2** **SHFT** =
1 **2** **SHFT** =
2 **4** **SHFT** =
2 **5** **SHFT** =
1 **4** **SHFT** =
2 **0** **SHFT** =
SHFT K
1 **0** **SHFT** =
1 **8** **SHFT** =
SHFT K

Analysis of Variance

The Analysis of Variance (AV) program performs a one-way analysis of variance for a completely randomized design. The program can handle from two to four groups. The group sizes do not have to be equal, but the total number of subjects in all groups combined must not exceed 83.

Output from AV includes the F ratio, degrees of freedom (total, between, and within), sums of squares and mean squares (total, between, and within), and the value of eta squared (the correlation ratio).

Analysis of Variance contains 15 options:

SHFT SPC

Starts AV, or clears the Pocket Computer's memory so you can enter a new data set.

SHFT =

Lets the computer accept each data value entered.

SHFT A

Lets you enter a label for use with your printer.

SHFT S

Displays the sum of squares (within).

SHFT D

Displays the sum of squares (between).

SHFT F

Displays the sum of squares (total).

SHFT G

Displays the degrees of freedom (within).

SHFT H

Displays the degrees of freedom (between).

SHFT J

Displays the degrees of freedom (total).

SHFT K

Displays the F ratio.

SHFT L

Ends entry of one group and prepares the computer to receive data for the next group.

SHFT Z

Displays eta squared.

SHFT X

Displays the mean square (within).

SHFT C

Displays the mean square (between).

SHFT V

Displays the mean square (total).

After loading AV, press **SHFT SPC** to start. The program name and a copyright notice will be displayed. Place the Analysis of Variance template over your keyboard.

You are now ready to begin entering data for the first analysis group. Start by typing each value on the keyboard and pressing **SHFT L**. The computer will display the number of subjects stored so far each time you enter a value. When all values have been entered for the first group, press **SHFT L**.

The computer will display: GRP 2. This indicates that the computer is ready to accept data values for the second group. Enter the data values for Group 2 in the same way as you did for Group 1. When all data is entered for this group, press **SHFT L**.

The computer will display: GRP 3., and you may enter data values for the third group. If your design has only two groups, simply press **SHFT L** again, and the computer will calculate the analysis of variance. If your design has more than two groups, enter the data values for the third group, and press **SHFT L** when you are finished.

The computer will display: GRP 4., showing that you may enter values for the fourth group. If your design has only three groups, press **SHFT L** again. The computer will begin the analysis. If you have a fourth

group, enter its data values, then press **SHFT L**. The computer will calculate the analysis of variance.

When the computer has finished its calculations, the **>** prompt will return to the screen. You may see the results by pressing **SHFT** and the appropriate key, as indicated on your template. For example, to see eta squared, press **SHFT Z**. To clear the memory and enter data for a new analysis, press **SHFT SPC**.

Note: You **cannot** add more data to a group once you have pressed **SHFT L**, nor can you add an extra group to the design once the calculations have been performed. If you leave out a value or group, you must press **SHFT SPC** and re-enter the data for all groups.

After you have found the F ratio and the between-groups and within-groups degrees of freedom, you can determine the chance probability level by running the Distributions program (D1).

Sample Run

The computer displays:

>
AV COPR.1982 TANDY CORP

1.
2.
3.
4.
GRP 2.
1.
2.
3.
4.
GRP 3.
1.
2.
3.
GRP 4.
>
18.02459448

You type:

SHFT SPC
1 2 SHFT -
1 5 SHFT -
1 6 SHFT -
1 8 SHFT -
SHFT L
2 1 SHFT -
1 9 SHFT -
2 4 SHFT -
3 0 SHFT -
SHFT L
5 SHFT -
7 SHFT -
1 0 SHFT -
SHFT L
SHFT L
SHFT K

Chi Square Analysis

The Chi Square (C/S) program performs a chi square test on data in the form of a contingency table. The table may have any dimensions from 1 X 2 through 5 X 5. You may enter the expected frequencies for the table, or let the computer calculate the expected frequencies automatically from the marginal totals.

Output from the Chi Square Analysis program includes the chi square value, degrees of freedom, and the number of cells containing expected frequencies less than 5.

If the test has only one degree of freedom, a correction for continuity is applied, and the name YATES is displayed along with the chi square value.

Chi Square Analysis contains 12 options:

SHFT SPC

Starts CS, or clears the Pocket Computer's memory so you can enter a new data set.

SHFT -

Lets the computer accept each data value entered.

SHFT A

Lets you enter a label for use with your printer.

SHFT G

Displays the number of cells with expected frequencies less than five.

SHFT H

Displays the value of chi squared.

SHFT J

Displays the degrees of freedom.

SHFT X

Indicates to the computer to begin chi square calculations.

SHFT C

Automatically calculates expected frequencies.

SHFT V

Lets you enter expected frequencies.

SHFT B

Lets you enter observed frequencies.

SHFT N

Lets you set up the number of columns in your contingency table.

SHFT M

Lets you set up the number of rows in your contingency table.

After loading CS, press **SHFT SPC** to get started. The computer will display the program name and a copyright notice. Place the Chi Square Analysis template over your keyboard.

First you must enter the number of columns and rows in your contingency table. Type the number of rows and press **SHFT M**. Next, type the number of columns in the table and press **SHFT N**.

Now you can begin entering observed frequencies into your table by pressing **SHFT B**. The display will request the value for each cell by displaying the row and column designation (for example, OBSERVED: ROW 1 COL 1). You will type the observed frequency for each cell, pressing **SHFT =** after each entry. When all observed frequencies cells have been filled, the computer will display: END OF OBSERVED DATA.

If you want the computer to automatically figure expected frequencies from the marginal totals in your table, press **SHFT C**. However, if you wish to enter the expected frequencies yourself, press **SHFT V**. The computer will request the expected frequency for each cell in the same way that it requested observed frequencies. Enter expected

frequencies for all cells, pressing **SHFT =** after each entry. When all cells have been filled, the computer will display: END OF EXPECTED DATA.

Now, press **SHFT X**. The computer will perform the chi square test. When the test is finished, the **>** prompt will be displayed. You may see the results of the test by pressing **SHFT** and the appropriate key, as indicated by your template. For example, to display the number of cells containing expected frequencies less than five, press **SHFT G**. You may clear the memory and start entering new data by pressing **SHFT SPC**.

After finding the chi square value and the degrees of freedom for the test, you can see the chance probability level by using the Distributions program (DI).

Sample Run

The computer displays:

>

CS COPR.1982 TANDY CORP

>

>

OBSERVED: ROW 1 COL 1

OBSERVED: ROW 1 COL 2

You type:

SHFT SPC

2 SHFT M

2 SHFT N

SHFT B

1 1 SHFT =

1 2 SHFT =

The screen will show:

OBSERVED: ROW 2 COL 1

OBSERVED: ROW 2 COL 2

END OF OBSERVED DATA

AUTO EXPECTED FREQ

>

(YATES) 3.244699071E-02

You type:

2 **1** **SHFT** **-**

2 **2** **SHFT** **-**

SHFT **C**

SHFT **X**

SHFT **H**

Distributions

The Distributions program lets you find information about selected statistical distributions by entering values on the keyboard, and contains six options:

SHFT SPC

Starts DI, or clears the Pocket Computer's memory so you can enter a new data set.

SHFT A

Lets you enter a label for use with your printer.

SHFT V

Calculates and displays the chi square distribution.

SHFT B

Calculates and displays the F distribution.

SHFT N

Calculates and displays the t distribution.

SHFT M

Calculates and displays the normal distribution.

Normal distribution—Given a mean, the standard deviation, and a value for X, DI will give you the corresponding Z score, the value of the normal density function ($f(X)$), the cumulative percentile, and the area under the normal curve between X and the

mean. Any number of X values may be evaluated without having to re-enter the mean and standard deviation.

t distribution—DI will calculate one-tail or two-tail probabilities for the t distribution. You will enter the value of t and the associated degrees of freedom, and the computer will give you an approximation of the exact chance probability in the tail(s) of the distribution.

F distribution—Approximations of exact chance probabilities for the F distribution may be found by entering the value of the F ratio, the between-groups degrees of freedom, and within-groups (error) degrees of freedom.

Chi square distribution—You may enter a chi square value and the associated degrees of freedom for the test and receive an approximation of the exact chance probability in the tail of the chi square distribution.

All calculations for the above functions are performed using standard approximation formulas. The DI program is excellent for finding probability values for statistical tests performed by the other programs in your Statistical Analysis Package.

Note: When running DI with a printer, it is not always necessary to press Enter after a display to make the program continue. Throughout this section, an asterisk (*) will appear next to each **ENTER** that is not necessary.

After loading DI, press **SHFT SPC** to start. The program name and a copyright notice will be displayed. Place the Distributions template over your keyboard.

Select the distribution you want by pressing **SHFT** and the appropriate key, as indicated on your template. For example, to receive information about the normal distribution, press **SHFT M**. As you run each option, various messages will appear on the display to guide you through the information needed by the computer. After all information is entered, the computer will calculate and display the results.

Normal Distribution

Start by pressing **SHFT M**. The display will show: MEAN ?_. Type the mean for your data (**0** for the standard normal distribution), and press **ENTER**.

The display will show: SD ?_. Type the standard deviation for your data (**1** for the standard normal distribution), and press **ENTER**.

The display will ask: X VALUE ?_. Type a value of X from your data, and press **ENTER**. The computer will display the Z score for that value.

Press **ENTER** * to see the value of the function at X. Press **ENTER** * and the computer will display the cumulative percentile. Press **ENTER** * again to see the percentage of the total area under the normal curve between the X value and the mean (displayed as MU).

If you are using a printer, the display will request another X value. You can enter another value for X, or you may select another type of distribution by pressing **SHFT** and the appropriate key.

If you are not using a printer, you can select another distribution when the total area percentage is displayed. To enter another X value, press **ENTER**.

t Distribution

Press **SHFT N** at the program name display. The display will ask: 1 TAIL OR 2 ?_. Type **1** or **2** for the type of probability approximation you want, and press **ENTER**.

The next question displayed is: T VALUE ?_. Type the value of t for which you want a probability estimate, and press **ENTER**.

The computer will ask: DF ?__. Type the degrees of freedom associated with the t value and press **ENTER**. The computer will calculate and display the probability value.

If you are using a printer, you will be asked for another t value. You may enter another value or choose another distribution by pressing **SHFT** and the appropriate key.

If you are not using a printer, you can choose another distribution, or press **ENTER** to enter another t value.

F Distribution

Press **SHFT B** at the program name display. The display will show: F VALUE ?__. Type the value of the F ratio, and press **ENTER**.

The computer will ask: DF 1 ?__. Type the between-groups (numerator or lesser) degrees of freedom, and press **ENTER**.

The next question is: DF 2 ?__. Type the within-groups (denominator or greater) degrees of freedom, and press **ENTER**. The computer will calculate and display the probability estimate.

If you are using a printer, you will be asked for another F value. You may enter another value or choose another distribution (**SHFT** and the appropriate key).

If you are not using a printer, you can choose another distribution or press **ENTER** to enter another value of F.

Chi Square Distribution

Press **SHFT V** at the program name display. The display will show: CHI SQ ?__. Type the chi square value and press **ENTER**.

The next question is: DF ?__. Type the degrees of freedom associated with the chi square test, and press **ENTER**. The computer will calculate and display the probability estimate for the test.

If you are using a printer, you will be asked for another chi square value. You may enter another value of chi square or choose another distribution by pressing **SHFT** and the appropriate key.

If you are not using a printer, select another distribution, or press **ENTER** to display the CHI SQ ?__ question again.

Note: At any point during the Chi Square function (or any of the Distributions program functions), you may select a different distribution by pressing **SHFT** and the appropriate key, as indicated on your template.

Sample Run

The computer displays:

>
DI COPR.1982 TANDY CORP
MEAN ?__

SD ?__

X VALUE ?__
Z SCORE = 1.03846
F(X) = 2.32668E-01
%ILE = 85.04801
AREA(MU,X) = 0.35048
X VALUE ?__
1 TAIL OR 2 ?__
T VALUE ?__

DF ?__

PROB = 0.01760
T VALUE ?__

You type:

SHFT SPC
SHFT M
4 5 . 2
ENTER
1 0 . 4
ENTER
5 6 ENTER
ENTER *
ENTER *
ENTER *
SHFT N
2 ENTER
2 . 4 7
ENTER
3 5 ENTER
ENTER *
SHFT B

The computer displays:

F VALUE ?__

DF 1 ?__

DF 2 ?

PROB = 0.00080

F VALUE ?__

CHI SQ ?__

DF ?__

PROB = 0.16009

CHI SQ ?__

DI COPR.1982 TANDY CORP

You type:

8 . 6 6
ENTER
2 ENTER
6 0 ENTER
ENTER *
SHFT V
6 . 5 7
ENTER
4 ENTER
ENTER *
SHFT SPC

Multiple Regression

The Multiple Regression (MR) program calculates regression statistics for a set of data using two predictor (independent) variables, employing the least squares method for fitting a straight line. Up to 24 subjects may be entered. Output from Multiple Regression includes the number of subjects, the raw regression coefficients for the two predictor variables, the regression constant, total, residual, and regression sums of squares, the coefficient of determination (R^2), and the standard error of estimate for the regression. MR also tests the statistical significance of the regression. The F ratio and degrees of freedom for the test can be displayed.

Multiple Regression contains 15 options:

SHFT SPC

Starts MR, or clears the Pocket Computer's memory so you can enter a new data set.

SHFT =

Lets the computer accept each data value entered.

SHFT A

Lets you enter a label for use with your printer.

SHFT S

Displays the coefficient of determination (R^2).

SHFT D

Displays the total sum of squares.

SHFT F

Displays the residual sum of squares.

SHFT G

Displays the regression sum of squares.

SHFT H

Displays the regression constant.

SHFT J

Displays the raw regression coefficient for the second predictor variable.

SHFT K

Displays the raw regression coefficient for the first predictor variable.

SHFT L

Displays the number of subjects.

SHFT Z

Displays the residual degrees of freedom.

SHFT X

Displays the F ratio.

(SHFT)C

Displays the standard error of estimate for the regression.

(SHFT)M

Lets the computer know that data input has ended.

After loading MR, press **(SHFT)SPC** to start. The name of the program and a copyright notice will be displayed. Place the Multiple Regression template over your keyboard.

Enter the value of the dependent variable (Y) by typing that value and pressing **(SHFT)=**. The display will show a single asterisk (*), letting you know that you may enter the value of the first predictor variable for the subject. Type that value, and press **(SHFT)=**. The display will now show two asterisks (**).

You may now enter the second predictor variable by typing the value and pressing **(SHFT)=**. The computer will display the number of subjects so far for which complete data is stored.

Data values for each of the other subjects (DV, IV#1, IV#2) are entered in the same way. When you have finished entering data for all subjects, press **(SHFT)M**. This tells the computer to begin regression calculations. When the computer is finished, the > prompt will be displayed.

Display the results of the calculations by pressing **(SHFT)** and the appropriate key, as indicated on your template. For example, to see the coefficient of determination, press **(SHFT)S**. You can clear the memory and begin entering a new data set by pressing **(SHFT)SPC**.

After finding the F ratio and the degrees of freedom for the regression, you can find the chance probability for the test by using the Distributions program (DI).

Please note that since the number of predictor variables is always two, the regression (lesser) degrees of freedom is also two, so there is no display for the regression degrees of freedom.

Sample Run

The computer displays:

>

MR COPR.1982 TANDY CORP

*

**

1.

*

You type:

(SHFT)SPC

2 5 . 2

(SHFT)=

1 0 (SHFT)=

1 2 (SHFT)=

3 0 . 6

(SHFT)=

1 5 (SHFT)=

The computer displays:

**
2.
*
**
3.
*
**
4.
*
**
5.
>
7.535008487E-01

You type:

1	3	SHFT	-
2	1	.	5
SHFT -			
1	2	SHFT	-
1	0	SHFT	-
3	2	.	8
SHFT -			
2	0	SHFT	-
1	8	SHFT	-
1	8	.	1
SHFT -			
1	5	SHFT	-
1	1	SHFT	-
SHFT M			
SHFT S			

Appendix A—Making a Backup

A Backup is a tape copy of a program and is an extremely effective method of insuring that an accident or equipment fault will not result in the loss of software. Your first action as owner of the Statistical Analysis Package should be to make working copies of the original cassettes and then put the originals away in a safe place.

Although it may be possible to make direct copies using two cassette recorders or on cassette duplicating equipment, the most reliable method is to use the computer itself to make the Backups. Also, for frequently used programs, you may wish to put them on separate cassettes for easier loading. Here are step-by-step instructions for making a Backup:

1. Connect the Cassette Interface to the cassette recorder and install the computer in the Cassette Interface.
2. Place the cassette containing the program(s) to be copied in the recorder, and either rewind the tape to the beginning or position the tape to a blank area just prior to the desired program. Place the recorder in the "Play" mode. It is recommended that the volume control setting be between 8 and 10 on your recorder, or between 5 and 7 if you are

using a Minisette-9. If your recorder has a tone control, set it at maximum treble.

3. Turn on the computer, make sure that it is in the DEF mode and type in: **C L O A D** name (name refers to the name of the program to be copied), and press **ENTER**. To make absolutely sure that the program has loaded correctly, use the loading verification procedure as described in the sixth instruction of this appendix.
4. When the program has been loaded into the computer and the cassette has stopped, remove the cassette and replace it with the cassette which is to receive the program copy. Either rewind the tape to the beginning or position it to the point where the copy is to start. You should leave about ten seconds of blank space if the copy is to follow another program on the same cassette. Place the recorder in the "Record" mode.
5. Make sure that the computer is in the DEF mode and type in: **C S A V E** name and press **ENTER**. The recorder will save your program.
6. Now rewind the cassette to the blank space just prior to the program, put the recorder into the "Play" mode and type in: **C L O A D** name and press **ENTER**.

This is the computer's verifying function. The recorder will start and compare the cassette copy with the program in the computer's memory. If the copy is good, the recorder will stop at the end of the program and the prompt sign (>) will reappear on the display. If an error occurred during the verification, the display will show an error message such as:

5.....

If the error message appears on the display, check the recorder volume setting and try the CLOAD? function once more. If you still get an error, the tape copy is probably damaged. Use the CSAVE function once more and verify the load. It is recommended that you use Radio Shack Supertape or TRS-80 certified cassettes for backing up your Pocket Computer programs.

7. Back up each program using Steps 1 through 6 above.
8. Put the original cassette away in a safe place and use it only for making working copies.

Appendix B—Maintenance

Maintenance of your Pocket Computer System is not difficult. Attention to the simplest points listed below should provide the best reliability and satisfaction:

1. Keep your program cassettes in their boxes when not in use. Do not expose cassettes to temperature extremes or magnetic fields. Never touch the exposed surface of the tape on the front edge of the cassette.
2. Clean and demagnetize the tape heads in the recorder at regular intervals. Follow the recommendations in the cassette recorder's manual.
3. The most reliable loading and saving is achieved by operating the cassette recorder on AC current, rather than batteries.
4. Use only fresh alkaline-type batteries in the recorder and Cassette Interface when operating your system away from AC current.
5. Always press the recorder's "Stop" key immediately after loading or saving a program. This will release the pressure on the rubber roller which pulls the tape and prevent the roller from

developing a permanent "flat" at the point of contact with the tape.

6. Always turn the computer OFF before installing it in or removing it from the Cassette Interface.

7. After removing the computer from the Cassette Interface, be sure to reinstall the protective plug to keep dirt out of the connector on the computer. Never touch the exposed parts on the Cassette Interface.





RADIO SHACK SOFTWARE LICENSE

- A.** Radio Shack grants to CUSTOMER an non-exclusive, paid up license to use on CUSTOMER'S computer the Radio Shack computer software received. Title to the media on which the software is recorded (cassette and/or disk) or stored (ROM) is transferred to the customer, but not title to the software.
- B.** In consideration for this license, CUSTOMER shall not reproduce copies of Radio Shack software except to reproduce the number of copies required for use on CUSTOMER'S computer (if the software allows a backup copy to be made), and shall include Radio Shack's copyright notice on all copies of software reproduced in whole or in part.
- C.** CUSTOMER may resell Radio Shack's system and applications software (modified or not, in whole or in part), provided CUSTOMER has purchased one copy of the software for each one resold. The provisions of this software License (paragraphs A, B, and C) shall also be applicable to third parties purchasing such software from CUSTOMER.

IMPORTANT NOTICE

ALL RADIO SHACK COMPUTER PROGRAMS ARE LICENSED ON AN "AS IS" BASIS WITHOUT WARRANTY.

Radio Shack shall have no liability or responsibility to customer or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by computer equipment or programs sold by Radio Shack, including but not limited to any interruption of service, loss of business or anticipatory profits or consequential damages resulting from the use or operation of such computer or computer programs.

NOTE: Good data processing procedure dictates that the user test the program, run and test sample sets of data, and run the system in parallel with the system previously in use for a period of time adequate to insure that results of operation of the computer or program are satisfactory.

This Warranty gives the original purchaser specific legal rights, and the original purchaser may have other rights which vary from state to state.

RADIO SHACK, A DIVISION OF TANDY CORPORATION

U.S.A.: FORT WORTH, TEXAS 76102

CANADA: BARRIE, ONTARIO L4M 4W5

TANDY CORPORATION

AUSTRALIA

280-316 VICTORIA ROAD
RYDALMERE, N.S.W. 2116

BELGIUM

PARC INDUSTRIEL DE NANINNE
5140 NANINNE

U. K.

BILSTON ROAD WEDNESBURY
WEST MIDLANDS WS10 7JN

TERMS AND CONDITIONS OF SALE AND LICENSE OF RADIO SHACK COMPUTER EQUIPMENT AND SOFTWARE
PURCHASED FROM A RADIO SHACK COMPANY-OWNED COMPUTER CENTER, RETAIL STORE OR FROM A
RADIO SHACK FRANCHISEE OR DEALER AT ITS AUTHORIZED LOCATION

LIMITED WARRANTY

I. CUSTOMER OBLIGATIONS

- A. CUSTOMER assumes full responsibility that this Radio Shack computer hardware purchased (the "Equipment"), and any copies of Radio Shack software included with the Equipment or licensed separately (the "Software") meets the specifications, capacity, capabilities, versatility, and other requirements of CUSTOMER.
- B. CUSTOMER assumes full responsibility for the condition and effectiveness of the operating environment in which the Equipment and Software are to function, and for its installation.

II. RADIO SHACK LIMITED WARRANTIES AND CONDITIONS OF SALE

- A. For a period of ninety (90) calendar days from the date of the Radio Shack sales document received upon purchase of the Equipment, RADIO SHACK warrants to the original CUSTOMER that the Equipment and the medium upon which the Software is stored is free from manufacturing defects. THIS WARRANTY IS ONLY APPLICABLE TO PURCHASES OF RADIO SHACK EQUIPMENT BY THE ORIGINAL CUSTOMER FROM RADIO SHACK COMPANY-OWNED COMPUTER CENTERS, RETAIL STORES AND FROM RADIO SHACK FRANCHISEES AND DEALERS AT ITS AUTHORIZED LOCATION. The warranty is void if the Equipment's case or cabinet has been opened, or if the Equipment or Software has been subjected to improper or abnormal use. If a manufacturing defect is discovered during the stated warranty period, the defective Equipment must be returned to a Radio Shack Computer Center, a Radio Shack retail store, participating Radio Shack franchisee or Radio Shack dealer for repair, along with a copy of the sales document or lease agreement. The original CUSTOMER'S sole and exclusive remedy in the event of a defect is limited to the correction of the defect by repair, replacement, or refund of the purchase price, at RADIO SHACK'S election and sole expense. RADIO SHACK has no obligation to replace or repair expendable items.
- B. RADIO SHACK makes no warranty as to the design, capability, capacity, or suitability for use of the Software, except as provided in this paragraph. Software is licensed on an "AS IS" basis, without warranty. The original CUSTOMER'S exclusive remedy, in the event of a Software manufacturing defect, is its repair or replacement within thirty (30) calendar days of the date of the Radio Shack sales document received upon license of the Software. The defective Software shall be returned to a Radio Shack Computer Center, a Radio Shack retail store, participating Radio Shack franchisee or Radio Shack dealer along with the sales document.
- C. Except as provided herein no employee, agent, franchisee, dealer or other person is authorized to give any warranties of any nature on behalf of RADIO SHACK.
- D. Except as provided herein, **RADIO SHACK MAKES NO WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**
- E. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation(s) may not apply to CUSTOMER.

III. LIMITATION OF LIABILITY

- A. EXCEPT AS PROVIDED HEREIN, RADIO SHACK SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAMAGE CAUSED OR ALLEGED TO BE CAUSED DIRECTLY OR INDIRECTLY BY "EQUIPMENT" OR "SOFTWARE" SOLD, LEASED, LICENSED OR FURNISHED BY RADIO SHACK, INCLUDING, BUT NOT LIMITED TO, ANY INTERRUPTION OF SERVICE, LOSS OF BUSINESS OR ANTICIPATORY PROFITS OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR OPERATION OF THE "EQUIPMENT" OR "SOFTWARE". IN NO EVENT SHALL RADIO SHACK BE LIABLE FOR LOSS OF PROFITS, OR ANY INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY BREACH OF THIS WARRANTY OR IN ANY MANNER ARISING OUT OF OR CONNECTED WITH THE SALE, LEASE, LICENSE, USE OR ANTICIPATED USE OF THE "EQUIPMENT" OR "SOFTWARE".

NOTWITHSTANDING THE ABOVE LIMITATIONS AND WARRANTIES, RADIO SHACK'S LIABILITY HEREUNDER FOR DAMAGES INCURRED BY CUSTOMER OR OTHERS SHALL NOT EXCEED THE AMOUNT PAID BY CUSTOMER FOR THE PARTICULAR "EQUIPMENT" OR "SOFTWARE" INVOLVED.

- B. RADIO SHACK shall not be liable for any damages caused by delay in delivering or furnishing Equipment and/or Software.
- C. No action arising out of any claimed breach of this Warranty or transactions under this Warranty may be brought more than two (2) years after the cause of action has accrued or more than four (4) years after the date of the Radio Shack sales document for the Equipment or Software, whichever first occurs.
- D. Some states do not allow the limitation or exclusion of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to CUSTOMER.

IV. RADIO SHACK SOFTWARE LICENSE

RADIO SHACK grants to CUSTOMER a non-exclusive, paid-up license to use the RADIO SHACK Software on **one** computer, subject to the following provisions:

- A. Except as otherwise provided in this Software License, applicable copyright laws shall apply to the Software.
- B. Title to the medium on which the Software is recorded (cassette and/or diskette) or stored (ROM) is transferred to CUSTOMER, but not title to the Software.
- C. CUSTOMER may use Software on one host computer and access that Software through one or more terminals if the Software permits this function.
- D. CUSTOMER shall not use, make, manufacture, or reproduce copies of Software except for use on **one** computer and as is specifically provided in this Software License. Customer is expressly prohibited from disassembling the Software.
- E. CUSTOMER is permitted to make additional copies of the Software **only** for backup or archival purposes or if additional copies are required in the operation of **one** computer with the Software, but only to the extent the Software allows a backup copy to be made. However, for TRSDOS Software, CUSTOMER is permitted to make a limited number of additional copies for CUSTOMER'S own use.
- F. CUSTOMER may resell or distribute unmodified copies of the Software provided CUSTOMER has purchased one copy of the Software for each one sold or distributed. The provisions of this Software License shall also be applicable to third parties receiving copies of the Software from CUSTOMER.
- G. All copyright notices shall be retained on all copies of the Software.

V. APPLICABILITY OF WARRANTY

- A. The terms and conditions of this Warranty are applicable as between RADIO SHACK and CUSTOMER to either a sale of the Equipment and/or Software License to CUSTOMER or to a transaction whereby RADIO SHACK sells or conveys such Equipment to a third party for lease to CUSTOMER.
- B. The limitations of liability and Warranty provisions herein shall inure to the benefit of RADIO SHACK, the author, owner and/or licensor of the Software and any manufacturer of the Equipment sold by RADIO SHACK.

VI. STATE LAW RIGHTS

The warranties granted herein give the **original** CUSTOMER specific legal rights, and the **original** CUSTOMER may have other rights which vary from state to state.

ENTER

Digitized by srujanika@gmail.com

10

CP

COPE

088

4

ENTER

LABEL

PRED

ST

1

10

DATA

CL
DA

STAT. ANAL.-C

ENTER LABEL					#CELLS $t < 5$	CHI SQUARE	df		ENTER DATA
	CALCU- LATE	AUTO EXPEC	BEGIN EXPEC		BEGIN OBSER	SET COLS	SET ROWS	CLEAR DATA	STAT. ANAL.-CS Cat. No. 26-3522

ENTER

LABEL

CHI
SQUARE

F

t

NORMAL

CLEAR
DATA

STAT. ANAL.-DI
Cat. No. 26-3522

ENTER



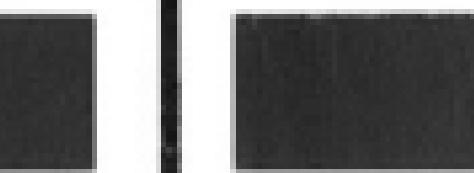
LABEL

SD'



EST

VAR'

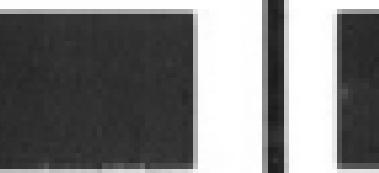


EST

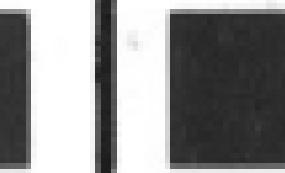
SD



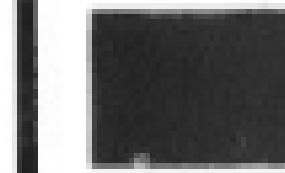
VAR



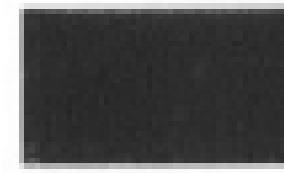
SUM



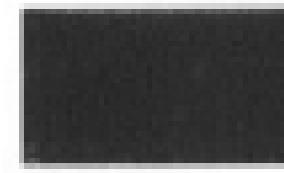
SUM



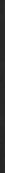
MEAN



N



ENTER



DATA

S.E.
MEAN

STAT. ANAL.-DS
Cat. No. 28-3522

CLEAR
DATA

ENTER LABEL	R SQUARED	SS TOTAL	SS RESID	SS REGR	CONST a	COEFF b2	COEFF b1	N	ENTER DATA
df RESID	F RATIO	S.E. EST							STAT. ANAL.-MR
						END DATA	CLEAR DATA		Cat. No. 25-3522